

# U.S. DEPARTMENT OF ENERGY



## FLOODPLAIN ASSESSMENT FOR THE GAS MAIN AND DISTRIBUTION SYSTEM UPGRADE



PANTEX PLANT \* AMARILLO, TEXAS \* November 2008



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## 1.0 Introduction

The onsite portion of the Gas Main and Distribution System Upgrade project would result in impacts to the 100-year floodplain of Playa 2. These impacts would result from trenching and natural gas pipeline installation activities.

In accordance with the regulations contained in Title 10 Code of Federal Regulations (CFR) Part 1022, Compliance with Floodplain/Wetlands Environmental Review Requirements, the U.S. Department of Energy National Nuclear Security Administration (USDOE/NNSA) has established policy and procedures to consider impacts on floodplains and wetlands as part of its decision-making process. This policy was developed in response to Executive Order 11990—Protection of Wetlands (May 24, 1977), and Executive Order 11988—Floodplain Management (May 24, 1977). These executive orders require federal agencies to evaluate and, to the extent possible, minimize the impacts of their projects on floodplains and wetlands. Under USDOE/NNSA policy, a floodplain and wetlands assessment is required for any activities involving floodplains or wetlands (10 CFR 1022).

This assessment examines how a USDOE/NNSA project to install approximately 3,400 linear feet of natural gas pipeline would affect a floodplain. The project is associated with the 100-year floodplain of Playa 2, located on USDOE/NNSA Pantex Plant property in Carson County, Texas (See Figure 1).

To assess the project's effects on the floodplain, information was gathered about the existing conditions and the activities to be associated with the project. This information was then used to predict and evaluate the positive and negative, direct and indirect, and long- and short-term effects.

This project would install approximately 3,400 linear feet of 10-inch diameter high-density polyethylene (HDPE) pipe and one isolation valve in the 100-year floodplain at Playa 2. The construction of this portion of the pipeline would include the following:

- Trench approximately 3,400 linear feet and install the HDPE pipe.
- Install the isolation valve and associated protective bollards.
- Restore the agricultural land to original grade and revegetate any impacted short-grass prairie with native grasses.

## 2.0 Background and History

The 10-inch gas main and part of the distribution piping system were installed in the early 1950s. *The DOE Accounting Handbook*, Chapter 10, Attachment 10-1, "Standard Service Lives," describes the design life of this system as 25 years; therefore, the older portions of the system have been operational for twice the design life. Natural gas is a required utility service that supports essential Plant operations and facilities at Pantex.

The gas main and distribution system upgrade is integrated with the *Pantex Ten-Year Comprehensive Site Plan* and supports DOE/NNSA's objectives within the Facilities and Infrastructure Recapitalization Program (FIRP). The goals of the gas main and distribution





Figure 1 - Map of Impacted Playa 2 Floodplain Area



system upgrade are to extend facility lifetimes, reduce maintenance and increase the reliability of essential facilities and infrastructure. The Future Needs Analysis developed for this project was used to design a system that can satisfy future natural gas capacity demands.

An Environmental Assessment (EA) for the Proposed Gas Main and Distribution System Upgrade project was completed in August, 2005 (DOE/NNSA, 2005) and the Finding of No Significant Impact was issued on September 1, 2005.

The offsite portion of the project has been completed and the onsite work is scheduled to start in January 2009. Design changes in the onsite route were required to avoid proximity to the existing Pantex Plant sanitary landfill, a construction borrow pit, and impacts to an ongoing major construction site. These design changes resulted in the gas main route crossing approximately 3,400 linear feet of the 100-year floodplain at Playa 2 (USACE, 2008).

### **3.0 Description of Work**

Approximately 27,113 linear feet of trenching would be required to install the onsite portion of the Gas Main and distribution system, of which approximately 3,400 linear feet would be trenched a minimum of 3.5 feet deep and 3 feet wide in the 100-year floodplain at Playa 2. The installation of one isolation valve and associated protective bollards would occupy an area of 10 feet x 10 feet and would also be located in the floodplain. The estimated width of the disturbance area during construction would be 40 feet. The total impact would be to 3.1 acres of floodplain during construction of the onsite portion of the project.

#### **3.1 Physiography**

Pantex Plant lies on the Southern High Plains (SHP) portion of the Great Plains at an average elevation of 3,500 feet. The surface of the SHP is nearly flat, but generally slopes southeastward at a rate of 1.5 to 1.9 m/km (8 to 10 ft/mile). The principal features of relief on the SHP are numerous shallow depressions called playas. These playas are internally drained, ephemeral, and were formed by the interaction of pedogenic, geomorphic, hydrochemical, and biologic processes contemporaneous with the deposition of the Blackwater Draw formation (BWXT Pantex, 2007).

The climate in the area is classified as semiarid, and is characterized by hot summers and relatively cold winters. The average annual rainfall is 49.7 cm (19.56 in.). Seventy-five percent of the annual precipitation falls between April and September. The region is classified as windy, with wind speeds exceeding 11 km/hour (7 miles/hour) more than 95 percent of the year. The potential gross lake surface evaporation in the area is estimated to be about 350 percent of the annual precipitation, or approximately 178 cm (70 in.) per year (BWXT Pantex, 2007).

#### **3.2 Existing Conditions**

Playa 2 is in the west-central portion of Pantex Plant. The areal extent of the 100-year floodplain is approximately 224 acres, which includes 74 acres of wetland (Herrera, 1996). The limit of the 100-year floodplain is delineated at an elevation of 3,526 feet (USACE, 1995).

### 3.3 Land Use

Current land use, in and adjacent to the project area at Playa 2, includes approximately 226 acres of cultivated land, 35 acres of revegetated uplands (formerly cultivated areas), and 104 acres of industrial use land (sanitary landfill and construction borrow pits). The cultivated lands are managed by Texas Tech Research Farms under a Service Agreement between USDOE/NNSA and Texas Tech University.

### 3.4 Hydrogeologic Conditions

Playa 2 is an internally drained, closed basin that receives direct storm water runoff from a watershed of approximately 2,527 acres. The runoff is either from overland sheet flow, or through channels and ditches that feed into the playa. Interaction between surface water and groundwater in the Pantex Plant area is limited to infiltration of direct precipitation and runoff, mainly through playas and ditches, to the perched and Ogallala aquifers (BWXT Pantex, 2007).

### 3.5 Soils

The soils, in and adjacent to the Playa 2 floodplain and wetland, are in the Pullman-Randall soil association. At Playa 2, this association includes Pullman clay loams (PuA and PuB, respectively); the Estacado clay loams (EsB); the Lofton clay loams (Lo); and the Randall clays (Ra) (USDA, 1962).

### 3.6 Flora

The upland area surrounding Playa 2 has vegetation typical of short-grass prairie in the area, which is dominated by buffalograss (*Buchloe dactyoides*), blue grama (*Bouteloua gracilis*), and plains prickly pear (*Opuntia macrorhiza*).

The Pullman, Estacado, and Lofton soils adjacent to Playa 2 also support managed cropland, consisting of either sorghum or winter wheat, and areas of revegetated grassland. The revegetated areas consist of buffalograss (*Buchloe dactyoides*), blue grama (*Bouteloua gracilis*), and sideoats grama (*Bouteloua curtipendula*). The upland areas at Pantex Plant are being managed based partly on the results of floristic surveys. The 1995 survey identified 52 species in the Pantex Plant uplands. There are no records of federally protected or candidate plant species occurring on Pantex Plant (BWXT Pantex, 2007).

### 3.7 Fauna

The faunal diversity in and near the project area at Playa 2 is typical of Pantex Plant and is consistent with species commonly found in the northern portions of the Southern High Plains. There are differences in habitat needs among short-grass prairie fauna species. The different slopes, soil types, and associated water regimes, and the influences of prairie dogs where they occur, all influence vegetative diversity and structure. The resulting availability of natural, diverse habitats provides for needs of the various native wildlife species. No critical habitat for threatened or endangered species is located on the Pantex Plant, or in Carson County (BWXT Pantex, 2007).



#### **4.0 Floodplain Effects**

The floodplain effects of this project are those identified from the project description that would or could modify the existing conditions of the Playa 2 floodplain. No wetlands would be affected by these activities. The following project activities have been identified as potentially affecting the existing floodplain conditions at Playa 2:

- Trenching and installing of gas main and isolation valves.
- Returning impacted areas to original, natural grade and revegetating short-grass prairie areas with native grasses; species and percentages according to the soil type to accomplish habitat restoration.
- Maintaining the new gas main system.

Floodplain effects are evaluated as positive or negative, direct or indirect, and long-term or short-term. At Pantex Plant, playa wetlands and floodplains are managed as multiple-resource, sustainable ecosystems. Project effects that are consistent with this management goal are considered positive, and effects that are not consistent with this goal are considered negative. In addition, project effects that reduce the size of the managed ecosystems are considered negative, and effects that increase the size of these ecosystems are considered positive. The identification of indirect and direct effects indicates whether or not the impacts to the floodplain or wetland are subject to intervening circumstances. Long- and short-term effects are determined by the relative permanence of the action in the floodplain or wetland.

The trenching and regrading activities of this project have the potential to impact the floodplain at Playa 2. Approximately 3.1 acres of floodplain, less than 1.4 percent of the Playa 2 floodplain area, would be involved in the trenching activities of this project. Storm water runoff may have the potential to erode denuded areas and transport sediments during trenching, installation, and re-vegetation, which would have a negative, direct, and short-term effect on existing conditions. The installation of the isolation valve has the potential to displace a small amount of floodplain volume (an increase in floodplain elevation of less than 0.001 inches) and would have a negative, direct, and long-term effect on existing conditions.

#### **4.1 Effects of Floodplain Activities on Lives and Property**

The effects of the project floodplain activities would not change conditions in a way that affects lives or property either positively or negatively, directly or indirectly, in either the long-or short-term.

#### **5.0 Alternatives**

Alternate routes that would totally avoid the floodplain would require a minimum of 1 mile (Northern route), and a maximum of 1.5 miles (Southern route) of additional trenching and 10-inch HDPE pipe. The northern route would impact approximately 4.8 additional acres of upland habitat, while the southern route would impact approximately 7.2 additional acres of upland habitat. Either would require revegetation. A southern route may also require the purchase of additional offsite right-of-way on Texas Tech property. These alternatives are not feasible because they would increase habitat impacts and project costs.

## 6.0 Mitigation

Two negative effects in the Playa 2 floodplain have been identified: the potential for erosion and sedimentation during trenching and regrading/revegetation activities, and the potential for displacing a small amount of floodplain volume with the installation of the isolation valve and associated protective bollards.

The negative effects of erosion and sedimentation should be minimized by controls such as silt/sediment fencing, geotextiles, riprap, gabions, etc. Contractors selected to perform the work would be required to propose erosion/sedimentation controls for review and approval by Pantex, as required by Pantex Plant Division I Specifications, Section 01558. The negative effects of displacing floodplain volume would not be mitigated, but the total displacement would result in less than a 0.001-inch increase in floodplain elevation.

## 7.0 Summary

In accordance with Title CFR Part 1022, a Statement of Findings based on the information in this document will be published. The statement of findings will include a brief description of the proposed action and an explanation of why it is located in a floodplain, the alternatives considered, a statement indicating if the action conforms to State and local floodplain requirements, and a brief description of the steps to be taken to minimize potential harm within the floodplain. After publication, a 15-day comment period is required before implementing the proposed action.

## 8.0 References

- BWXT Pantex, 2007. *Environmental Information Document – In Support of the National Environmental Policy Act Documents for Pantex Plant*, Amarillo, Texas, January
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- USACE, 1995. *Floodplain Delineation Report, Department of Energy Pantex Plant, Amarillo, Texas*, U.S. Army Corps of Engineers, Tulsa District, Floodplain Management Services Planning Division, P.O. Box 61, Tulsa, Oklahoma, January
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